Repeat Sales Index Report
Residential • May 2010

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This report reflects an important milestone in the recent housing cycle with preliminary April data showing the first year over year, market wide increase in house prices. Prices for lower priced houses and the foreclosure segment of the market, which were positive for the first time last month, continued to increase on an annual basis. It has been almost three years since there has been an increase in the ASU-RSI. While increases in house prices are occurring only in certain portions of the market, steady improvement continues in the rest of the market with the exception of the townhouse/condo segment. The data for February 2010 reveals that overall house prices declined by 7 percent in the Phoenix metro area, which is less than the 9 percent decline for January and 13 percent in December (Table 1). The preliminary estimate for March has prices declining at 3 percent leading up to a 1 percent increase in April. Prices may continue to increase very slowly for the next few months but price stability rather than increases is likely for the rest of the year.

In contrast to the overall 7 percent annual decline, the February to February decline for lower priced homes was 4 percent but this swings to a 9 percent increase by April. Higher priced houses have not shown a significant slowdown in their rate of decline until the past several months but the preliminary decline for April is down to 3 percent. For homeowners with higher priced houses, achieving price stability would be an important milestone after years of price declines. The total decline in prices from the mid-2006 peak is now approximately 48 percent, which breaks down to 57 and 40 percent declines for lower and higher priced houses, respectively. The overall median price for sales that were included in the February index was $127,000 but the preliminary figure for April is $135,000, almost back to the level last seen in December 2008.

<table>
<thead>
<tr>
<th></th>
<th>OVERALL</th>
<th>LOWER PRICED</th>
<th>HIGHER PRICED</th>
<th>TOWNHOUSE / CONDO</th>
<th>FORECLOSURES</th>
<th>NON-FORECLOSURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb. 2009 – Feb. 2010</td>
<td>-6.7</td>
<td>-3.8</td>
<td>-8.4</td>
<td>-26.3</td>
<td>-1.4</td>
<td>-17.9</td>
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<tr>
<td>Jan. 2010 - Feb. 2010</td>
<td>-1.3</td>
<td>-1.9</td>
<td>-1.1</td>
<td>0.4</td>
<td>-0.4</td>
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<tr>
<td>1989–1992</td>
<td>-7.7</td>
<td>-3.9</td>
<td>-12.8</td>
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<td>2006–Feb. 2010</td>
<td>-47.3</td>
<td>-57.1</td>
<td>-39.2</td>
<td>-49.8</td>
<td>-54.6</td>
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<td>Median Price - Feb. 2010</td>
<td>$127,000</td>
<td>$92,000</td>
<td>$250,000</td>
<td>$86,400</td>
<td>$115,000</td>
<td>$155,000</td>
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The prices of foreclosed houses declined at a 1 percent rate from February 2009 to February 2010 but by April prices are expected to rise by 6 percent following a 5 percent annual increase in March. This turnaround in the foreclosure RSI reflects both the substantial price declines that have occurred over the past two years and the increase in demand from first-time buyers and investors. However, unless the Phoenix economy improves substantially, a few more months of price increases for foreclosures are likely to be followed by relatively stable prices for the rest of 2010.

In contrast, non-foreclosure house prices declined at an annual rate of 18 percent in February with the preliminary rate of decline at 13 percent by March and 8 percent for April. While the foreclosure segment of the market was turning around, non-foreclosure house prices had been declining at approximately a 20 percent annual rate from October 2008 through November 2009. However, it appears that price declines finally are slowing. The data indicate that price changes in the non-foreclosure segment of the market appear to follow the foreclosure market by about six months. If this pattern continues, it will be later this summer before non-foreclosure prices turn positive. For those homeowners not facing the threat of foreclosure, this will be welcome news.

The median price for foreclosed houses in February was $115,000 up substantially from a low of $97,000 last May but the preliminary median in April is up only slightly from February. Prices since October 2009 have been in the range of $115,000 to $120,000 and may well remain in that general range for the foreseeable future unless there is a significant change in the number of houses going into foreclosure or a turnaround in the Phoenix economy. For non-foreclosure houses the median price was $155,000 in February with a preliminary median of $160,500 by April.

The decline in the townhouse/condo RSI slowed slightly to 26 percent in February compared to 28 percent in December with preliminary rates of decline for the next two months at 19 percent. It appears that the most rapid declines (-36 percent) occurred last summer but the best that can be said about townhouse/condo prices is that the declines finally appear to be slowing. The median price of townhouse / condo units was $86,400 in February with forecasted medians the next two months of $83,500 and $81,000.

**Regions**

Continuing the trend, price declines slowed in February and they were in the single digit range in all regions except the Northeast where the annual decline was 10.1 percent (Table 2). The declines represent a dramatic slowdown since last fall and in the next few months at least a few regions should begin to show price increases. In terms of total declines from the 2006 peak, the Southwest is down the most, 58 percent, but even in the Northeast prices have dropped 38 percent. Three regions still show total declines in excess of 50 percent.
### TABLE 2

**CHANGE IN HOUSE PRICES BY REGION**

(Percent)

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>CENTRAL</td>
<td>-7.4</td>
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<tr>
<td>NORTHWEST</td>
<td>-6.5</td>
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<tr>
<td>SOUTHWEST</td>
<td>-6.4</td>
<td>0.2</td>
<td>-21.2</td>
<td>-57.9</td>
</tr>
</tbody>
</table>

Cities

The decline in house prices from February 2009 to February 2010 slowed compared to the January data for all cities. Annual rates of decline vary considerably from 5.8 percent in Peoria to over 15 percent in Tempe. Interestingly, the rate of decline in Tempe, which had been among the least affected cities, is essentially unchanged since last fall. For five of the eight cities the February declines are in the single digit range or very close to it. In terms of total declines from the peak, only Glendale and Peoria are still over 50 percent.

### TABLE 3

**CHANGE IN HOUSE PRICES BY CITY**

(Percent)

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>CHANDLER</td>
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<td>SCOTTSDALE/</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PARADISE</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>VALLEY</td>
<td>-10.0</td>
<td>-0.9</td>
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<td>-36.5</td>
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<td>SUN CITY/WEST</td>
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<td>-10.5</td>
<td>-39.6</td>
</tr>
<tr>
<td>TEMPE</td>
<td></td>
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<td>-1.9</td>
<td>-38.5</td>
</tr>
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</table>
Methodology

The use of repeat sales is the most reliable way to estimate price changes in the housing market because the repeat sales approach eliminates the need to deal with the many issues associated with the heterogeneous nature of housing. Repeat sales can be used to measure the price change of the same housing unit over time. A large number of repeat sales over many years can be analyzed to develop a repeat sales index. In contrast, indices developed using regression analysis provide estimates of price changes over time while simultaneously attempting to control for differences in house characteristics, location, demographics and market conditions, etc. within the model. Regression analysis can and does produce meaningful estimates of price changes but the results are not as reliable as those produced using repeat sales data. An even less rigorous approach would be to simply average sale prices by zip code or some other geographic area where the mix of housing sizes and ages, etc. would be different each month. The percent changes based on medians or averages would reflect not only price changes but also differences in the sizes, ages and other characteristics of the houses sold each month.

The W.P. Carey School of Business – Repeat Sales Index (RSI) tracks very closely to the S&P/Case - Shiller index for Phoenix since the same methodology is employed for calculating both indices. The S&P/Case-Shiller index has been developed for 20 metropolitan areas and is being used as a basis for trading housing futures contracts in 10 of those markets. Any differences between the two indices are probably due to the way the data has been cleaned prior to the calculation process. The S&P/Case-Shiller index is proprietary so the cleaning procedure used in connection with that index could not be completely duplicated. However, following S&P/Case-Shiller, the cleaning process used with the ASU - RSI excludes pairs where the first sale involved new construction and pairs where sales occurred within six months of each other. Sale pairs with extremely high or low annual rates of price change are excluded since at least one of the transactions may involve a data error. The same justification is used to drop sales with extremely high or low prices or prices per square foot prior to matching the sale pairs. A more detailed explanation of the data cleaning and calculation process is contained in the ASU-RSI Methodology Report.

The house price data used in the S&P/Case-Shiller index starts in January 1989. Beginning with January 1990, the percent change from the same month in the previous year is reported. The ASU – RSI also begins with January 1989 data so the same percent change calculation also begins in January 1990 and is reported for each month since then. There is seasonality in house price data so month to month changes may not accurately reflect changes in market conditions and would cover a very short time period. Calculating a percent change from the same month last year controls for whatever seasonality may be present in the data. Annual rates of change typically are thought of applying to a calendar year but in this report the annual rates that are reported would be measuring
change over the preceding twelve months. To smooth the index the rate of return calculated from each sale pair is included in calculations for a total of three months before it is published. Results using data for the two newest months are labeled as preliminary.

The S&P/Case-Shiller index is published only for the entire Phoenix metro area. One major advantage to the ASU-RSI is that in addition to the overall index, indices have been calculated for higher and lower priced houses, smaller geographic areas (regions and selected cities) and for the housing market segmented in various ways. Price changes for the attached portion of the housing market (townhouse / condominiums) are presented as a repeat sales index using the same methodology and indices are also estimated for higher and lower priced single-family detached houses and for foreclosure and non-foreclosure sales. The monthly data are divided into two groups based on the median price of all single-family houses sold. Sales are then paired within each of the two data sets and a repeat sales index is calculated for each. The foreclosure sale pairs are formed using two foreclosure sales or with a foreclosure sale paired with an earlier non-foreclosure sale of the house. The metro area has also been divided into five regions and an index has been calculated for each. All repeat sales used in the metro index are included in one of the five regional indices. Indices have also been calculated for eight individual cities where there are a sufficient number of repeat sales a reliable index to be estimated. A list of the cities included in each region is in Table 4.

The graphs contained in this report show the annual rate of change in house prices for the Phoenix metropolitan area on a monthly basis as well as median house prices. Figures 1 and 2 compare the change in the overall, lower and higher priced indices to the overall trend in the index, where the trend was estimated using data from January 1989 through December 2003. Figure 3 makes the same type of comparison using the median price of single-family sales that were used to form sale pairs for the current month, not the median price of all sales that occurred during the month. Since each index is a moving three month average, preliminary estimates of the index and future median prices for the entire market are included for the next two months (March and April) in Figures 1-6. Figures 4 and 5 include the townhouse / condominium RSI compared to the single-family RSI presented earlier in Figures 1 and 2. The foreclosure and non-foreclosure RSIs are in Figure 6 while Figure 7 has median prices for foreclosure and non-foreclosure houses and townhouse / condo units. Figures 8-15 contain graphs for the regions and cities for two different time periods. Four of the graphs present the price changes from January 1990 through February 2010 while the other four graphs cover the current housing cycle beginning in January 2004. Due to data limitations, a reliable index for Gilbert could not be calculated until January 1999 so the annual changes for Gilbert in Figures 10 and 11 start in January 2000.
<table>
<thead>
<tr>
<th>REGION</th>
<th>CITIES</th>
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<td>NORTHEAST</td>
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<td>LITCHFIELD PARK</td>
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Figure 1
Phoenix Single-Family Repeat Sales Index (RSI)
Annual Percent Change
January 1990 - April 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data

February: 1, Upper -8%  2, Lower -4%
Figure 2
Phoenix Single-Family Repeat Sales Index (RSI)
Annual Percent Change
January 2004 - April 2010

Metro Area
Upper Range¹
Lower Range²

March and April are Preliminary

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data

February: 1, Upper -8%  2, Lower -4%
Figure 3
Phoenix Median Single-Family House Prices
January 1989 - April 2010

Trend
Metro Area
Upper Range¹
Lower Range²

March and April are Preliminary

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data

February: 1, Upper $250,000  2, Lower $92,000
Figure 4
Phoenix Single-Family and Townhouse/Condominium Repeat Sales Index (RSI)
Annual Percent Change
January 1990 - April 2010

March and April are Preliminary

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data

February: Single-Family -7%; TH/Condo -26%
Figure 5
Phoenix Single-Family & Townhouse/Condominium Repeat Sales Index (RSI)
Annual Percentage Change
January 2004 - April 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data

February: Single-Family -7%; TH/Condo -26%
Figure 6
Phoenix Single-Family Foreclosure Repeat Sales Index (RSI) Annual Percentage Change
January 2001 - April 2010

March and April are Preliminary

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice

Data Provided by Ion Data

February: 1, Foreclosure -1%; 2, Non-Foreclosure -18%
Figure 7
Phoenix Foreclosures, Non-Foreclosures and Townhouse/Condominium Median Prices
January 1989 - April 2010

Trend
TH-Condo¹
Foreclosures²
Non-Foreclosures³

March and April are Preliminary

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
February: 1, TH/Condo $86,000  2, Foreclosures $115,000  3, Non-Foreclosures $155,000
Figure 8
Regional Single-Family Repeat Sales Index (RSI)
Annual Percent Change
January 1990 - February 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 10
Chandler, Gilbert, Mesa, & Tempe Single-Family Repeat Sales Index (RSI)
Annual Percent Change
January 1990 - February 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 11
Chandler, Gilbert, Mesa & Tempe Single-Family Repeat Sales Index (RSI)
Annual Percent Change
January 2004 - February 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 13
Glendale, Peoria, & Sun City/Sun City West Single-Family Repeat Sales Index (RSI)
Annual Percent Change
January 2004 - February 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 14
Scottsdale/Paradise Valley & Phoenix Single-Family Repeat Sales Index (RSI)
Annual Percent Change
January 1990 - February 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data
Figure 15
Scottsdale/Paradise Valley & Phoenix Single-Family Repeat Sales Index (RSI)
Annual Percent Change
January 2004 - February 2010

Source: ASU W.P. Carey School of Business; Center for Real Estate Theory and Practice
Data Provided by Ion Data